

Claims:

1. An adjustable arm assembly attachable at one end to a suitable vehicle and being capable of deployment substantially orthogonally to the direction of movement of said vehicle; said arm being substantially elongated and including two or more articulately connected sections and one or more actuator means capable of changing the orientation at least two said sections with respect to each other.
2. An adjustable arm assembly as claimed in claim 1, wherein the lower or outer surface of at least one said section forms a working surface provided with at least one tool adapted for interaction with a terrain surface.
3. An adjustable arm assembly as claimed in claim 1 or claim 2, wherein the lower or outer surface of two or more said sections forms a continuous working surface provided with at least one tool.
4. An adjustable arm assembly as claimed in claim 2 or claim 3, wherein said working surface of each section may be longitudinal curved or straight in the vertical plane.
5. An adjustable arm assembly as claimed in any one of claims 2-4, wherein two or more of said working surfaces are of different lengths longitudinally and/or laterally.
6. An adjustable arm assembly as claimed in any one of claims 2-5, wherein the longitudinal curvature of the or each said working surface can be altered in the vertical plane by said actuators.
7. An adjustable arm assembly as claimed in any one of the preceding claims, wherein the or each actuator means is capable of altering the angle between adjacent sections to coil the arm assembly for transport and/or storage and uncoil for use.
8. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said actuator means are attached between adjacent sections and between the said attached end of the arm and a vehicle mounting means.
9. An adjustable arm assembly as claimed in any one of one of claims 2-8, wherein two or more tools on at least one working surface are inter-linked by a movable conveying means.
10. An adjustable arm assembly as claimed in any one of the preceding claims, wherein one or more tools are positioned at fixed locations on at least one working surface.

11. An adjustable arm assembly as claimed in claim 9 or 10, wherein two or more working surfaces are provided with separate conveying means.
12. An adjustable arm assembly as claimed in any one of claims 9-11, wherein the or each said conveying means is/are movable by at least one drive.
13. An adjustable arm assembly as claimed in any one of claims 9-12, wherein each conveying means is separately provided with at least one drive.
14. An adjustable arm assembly as claimed in any one of claims 9-13, wherein at least one said conveying means is constrained to move within a closed path.
15. An adjustable arm assembly as claimed in any one of claims 9-14, wherein said conveying means is constrained by a slotted track on said working surface with the or each tool projecting outwardly from said track.
16. An adjustable arm assembly as claimed in any one of claims 9-15, wherein said conveying means passes around at least two direction-changing means.
17. An adjustable arm assembly as claimed in claim 16, wherein at least one of said direction changing means is a drive.
18. An adjustable arm assembly as claimed in any one of claims 14-17, wherein said closed path is located substantially about the periphery of at least one working surface.
19. An adjustable arm assembly as claimed in any one of claims 14-18, wherein said conveying means is capable of bi-directional movement along said closed path.
20. An adjustable arm assembly as claimed in any one of claims 9-19, wherein said conveying means is selected from the group including a chain, belt, rope, wire or hawser.
21. An adjustable arm assembly as claimed in any one of preceding claims, wherein at least one section is formed from two sub-units which may be pivoted with respect to each other about a mutual pivot axis orthogonal to the direction of vehicle travel in use.
22. An adjustable arm assembly as claimed in any one of claims 14-21, wherein portions of said closed path intermediate said direction changing means are substantially parallel and extend substantially along opposing longitudinal edges of said working surface.

23. An adjustable arm assembly as claimed in any one of claims 14-22, wherein said portions of the closed path along opposing longitudinal edges of said working surface are substantially parallel.
24. An adjustable arm assembly as claimed in any one of claims 14-23, wherein the said portion of the closed path along one longitudinal edge of at least one working surface is vertically elevated with respect to the portion of the said path along the opposing longitudinal edge.
25. An adjustable arm assembly as claimed in claim 24, wherein the said vertical elevation of the portions of the closed path along one longitudinal edge with respect to the portion of the path along the opposing longitudinal edge is adjustable.
26. An adjustable arm assembly as claimed in claim 24 or 25, wherein the said vertical elevation is adjustable by means of pivoting the said arm assembly about a horizontal axis co-planar with the longitudinal axis of the elongated arm assembly.
27. An adjustable arm assembly as claimed in any one of claims 24-26, wherein the said vertical elevation is adjustable by pivoting and/or height adjusting at least one of said direction changing means.
28. An adjustable arm assembly as claimed in any one of claims 24-27, wherein the said vertical elevation is adjustable by pivoting said sub-units about said mutual pivot axis.
29. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tool is adapted for cutting, scraping/pushing, packing, smoothing and/or rolling a terrain surface.
30. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said terrain surface includes snow, ice, sand, soil, mud, building debris, grass, crops, undergrowth, coal, aggregate, or particulate substances.
31. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tools are selected from the group including a paddle, scraping element, rasping element, a cutter shaft, spiral cutter, brushing roller, pick-up roller and any combination of same.
32. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tools are rotatably mounted.
33. An adjustable arm assembly as claimed in any one of the preceding claims, wherein

the said arm assembly is pivotably attachable to said vehicle about a vertical axis, enabling the or each section to be pivoted for deployment on either side of the said vehicle.

34. An adjustable arm assembly as claimed in any one of the preceding claims, wherein the said arm assembly may be moved in the vertical plane.
35. An adjustable arm assembly as claimed in any one of the preceding claims, wherein the said arm assembly may be moved transversely to the direction of movement of the vehicle.
36. An adjustable arm assembly as claimed in any one of the preceding claims, wherein the arm assembly may be at least partially rotated about an axis in the horizontal plane.
37. An adjustable arm assembly as claimed in any one of claims 2-36, wherein one or more supporting devices are located at predetermined fixed positions about one or more working surface(s).
38. An adjustable arm assembly as claimed in claim 37, wherein said predetermined fixed positions include the longitudinal edges of said working surface and between said opposed portions of said closed path intermediate said direction changing means.
39. An adjustable arm assembly as claimed in claim 37 or 38, wherein at least two of said supporting devices are laterally offset with respect to each other.
40. An adjustable arm assembly as claimed in any one of claims 37-39, wherein at least one supporting device is located at the intersection of adjacent working surfaces.
41. An adjustable arm assembly as claimed in any one of claims 37-40, wherein one or more said supporting devices are formed as a said tool.
42. An adjustable arm assembly as claimed in any one of claims 37-41, wherein one or more said supporting devices are configured to contact the terrain surface in use and thereby provide support by transferring at least a portion of the arm assembly weight to the terrain surface.
43. An adjustable arm assembly as claimed in any one of the preceding claims, wherein at least one section is independently pivotable with respect to an adjacent section about an axis orthogonal to the direction of movement of the arm assembly when

deployed in use.

44. An adjustable arm assembly as claimed in any one of claims 2-43, wherein one or more flexible grooming elements may be affixed to the longitudinal edge of one or more working surface facing away from the direction of movement of the said vehicle, configured such that a trailing edge of the or each grooming element is wiped across the adjacent surface of the terrain when in use.
45. An adjustable arm assembly as claimed in claim 44, wherein said flexible grooming elements are detachable.
46. An adjustable arm assembly as claimed in claim 44 or 45, wherein said flexible grooming elements are movable between said in-use position and a stand-by position whereby said grooming elements are retained out of contact with the terrain surface.
47. An adjustable arm assembly as claimed in any one of claims 44-46, wherein said grooming elements are located along both said opposing longitudinal sides of said working surface.
48. An adjustable arm assembly attachable at one end to a suitable vehicle and being capable of deployment substantially orthogonally to the direction of movement of said vehicle; said arm being substantially elongated and wherein a lower or outer surface of said arm forms a working surface provided with at least one tool adapted for interaction with a terrain surface
49. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said working surface may be longitudinal curved or straight in the vertical plane.
50. An adjustable arm assembly as claimed in any one of the preceding claims, wherein two or more tools on said working surface are inter-linked by at least one movable conveying means.
51. An adjustable arm assembly as claimed in any one of the preceding claims, wherein one or more tools are positioned at fixed locations on said working surface.
52. An adjustable arm assembly as claimed in any one of claims 50-51, wherein said working surface is provided with two or more distinct conveying means.
53. An adjustable arm assembly as claimed in any one of claims 50-52, wherein the or each said conveying means is/are movable by at least one drive.

54. An adjustable arm assembly as claimed in any one of claims 50-53, wherein each conveying means is separately provided with at least one drive.
55. An adjustable arm assembly as claimed in any one of claims 50-54, wherein at least one said conveying means is constrained to move within a closed path.
56. An adjustable arm assembly as claimed in any one of claims 50-55, wherein said conveying means is constrained by a slotted track on said working surface with the or each tobl projecting outwardly from said track.
57. An adjustable arm assembly as claimed in any one of claims 50-56, wherein said conveying means passes around at least two direction-changing means.
58. An adjustable arm assembly as claimed in claim 57, wherein at least one of said direction changing means is a drive.
59. An adjustable arm assembly as claimed in any one of claims 55-58, wherein said closed path is located substantially about the periphery of said working surface.
60. An adjustable arm assembly as claimed in any one of claims 50-59, wherein said conveying means is capable of bi-directional movement along said closed path.
61. An adjustable arm assembly as claimed in any one of claims 50-60, wherein said conveying means is selected from the group including a chain, belt, rope, wire, or hawser.
62. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said arm is formed from two sub-units which may be pivoted with respect to each other about a mutual pivot axis orthogonal to the direction of vehicle travel in use.
63. An adjustable arm assembly as claimed in any one of claims 55-62, wherein portions of said closed path intermediate said direction changing means are substantially parallel and extend substantially along opposing longitudinal edges of said working surface.
64. An adjustable arm assembly as claimed in any one of claims 55-63, wherein said portions of the closed path along opposing longitudinal edges of said working surface are substantially parallel.
65. An adjustable arm assembly as claimed in any one of claims 55-64, wherein the said portion of the closed path along one longitudinal edge of at least one working surface is vertically elevated with respect to the portion of the said path along the opposing

longitudinal edge.

66. An adjustable arm assembly as claimed in claim 65, wherein the said vertical elevation of the portions of the closed path along one longitudinal edge with respect to the portion of the path along the opposing longitudinal edge is adjustable.
67. An adjustable arm assembly as claimed in claim 65 or 66, wherein the said vertical elevation is adjustable by means of pivoting the said arm assembly about a horizontal axis co-planar with the longitudinal axis of the elongated arm assembly.
68. An adjustable arm assembly as claimed in any one of claims 65-67, wherein the said vertical elevation is adjustable by pivoting and/or height adjusting at least one of said direction changing means.
69. An adjustable arm assembly as claimed in any one of claims 65-68, wherein the said vertical elevation is adjustable by pivoting said sub-units about said mutual pivot axis.
70. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tool is adapted for cutting, scraping/pushing, packing, smoothing and/or rolling a terrain surface.
71. An adjustable arm assembly as claimed in claim 70, wherein said terrain surface includes snow, ice, sand, soil, mud, building debris, grass, crops, undergrowth, coal, aggregate, or particulate substances.
72. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tools are selected from the group including a paddle, scraping element, rasping element, a cutter shaft, spiral cutter, brushing roller, pick-up roller and any combination of same.
73. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tools are rotatably mounted.
74. An adjustable arm assembly as claimed in any one of the preceding claims, wherein the said arm assembly is pivotably attachable to said vehicle about a vertical pivot point, enabling the or each section to be pivoted for deployment on either side of the said vehicle.
75. An adjustable arm assembly as claimed in any one of the preceding claims, wherein the said arm assembly may be moved in the vertically plane.
76. An adjustable arm assembly as claimed in any one of the preceding claims, wherein

the said arm assembly may be moved transversely to the direction of movement of the vehicle.

77. An adjustable arm assembly as claimed in any one of the preceding claims, wherein the arm assembly may be at least partially rotated about an axis in the horizontally plane.
78. An adjustable arm assembly as claimed in any one of the preceding claims, wherein one or more supporting devices are located at predetermined fixed positions about said working surface.
79. An adjustable arm assembly as claimed in claim 78, wherein said predetermined fixed positions include the longitudinal edges of said working surface and between said opposed portions of said closed path intermediate said direction changing means.
80. An adjustable arm assembly as claimed in claim 78 or 79, wherein at least two of said supporting devices are laterally offset with respect to each other.
81. An adjustable arm assembly as claimed in any one of claims 78-80, wherein one or more said supporting devices are formed as a said tool.
82. An adjustable arm assembly as claimed in any one of claims 78-81, wherein one or more said supporting devices are configured to contact the terrain surface in use and thereby provide support by transferring at least a portion of the arm assembly weight to the terrain surface.
83. An adjustable arm assembly as claimed in any one of the preceding claims, wherein one or more flexible grooming elements is affixed to the longitudinal edge of said working surface facing away from the direction of movement of the said vehicle, configured such that a trailing edge of the or each grooming element is wiped across the adjacent terrain surface when in use.
84. An adjustable arm assembly as claimed in claim 83, wherein said flexible grooming elements are detachable.
85. An adjustable arm assembly as claimed in claim 83 or 84, wherein said flexible grooming elements are movable between said in-use position and a stand-by position whereby said grooming elements are retained out of contact with the terrain surface.

86. An adjustable arm assembly as claimed in any one of claims 83-85, wherein said grooming elements are located along both said opposing longitudinal sides of said working surface.
87. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said arm assembly is pivotably attachable to said vehicle by a detachable vehicle mounting means.
88. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tools are hinged to move freely in one direction along the longitudinal axis of the section, but to be fixed in the reciprocal direction.
89. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said tools are hinged to move freely in one direction orthogonal to the longitudinal axis of the section, but to be fixed in the reciprocal direction.
90. An adjustable arm assembly as claimed in any one of the preceding claims, wherein said arm assembly is integrally attached to said vehicle.